

Claims

- 1 1. A data collection apparatus, comprising:
- 2 a sensing unit for attaching to a structure or live subject for sensing a parameter of
- 3 the structure or live subject, said sensing unit comprising a sensor, a first data
- 4 storage device, and a transmitting device, said first data storage device for storing
- 5 data from said sensor;
- 6 a control unit separable from said sensing unit, said control unit comprising a data
- 7 receiving device and a second data storage device different from said first storage
- 8 device, said data receiving device to receive data transmitted from said data sensing
- 9 unit, said second data storage device for storing said data received from said sensing
- 10 unit; and
- 11 a triggering device for modifying the storing of data being stored to said first data
- 12 storage device or for initiating transmission of data from said sensing unit to said
- 13 control unit, wherein said triggering device is controlled by a real time change in
- 14 information about the structure or live subject.
- 1 2. The apparatus as recited in claim 1, wherein said sensor comprises an accelerometer,
- 2 displacement sensor, strain gauge, pressure gauge, thermometer, flow monitor, heart
- 3 monitor, EKG, EMG, EEG, blood monitor, force gauge, humidity monitor, growth
- 4 rate monitor, ripeness monitor, light intensity gauge, radiation detector, chemical
- 5 detector, corrosion detector, or toxic monitor.
- 1 3. The apparatus as recited in claim 2, wherein said sensor comprises an array of
- 2 accelerometers.

- 1 4. The apparatus as recited in claim 2, wherein said sensor comprises a linear or angular
2 accelerometer.
- 1 5. The apparatus as recited in claim 2, wherein said sensor comprises a resistive
2 accelerometer or a piezoelectric accelerometer.
- 1 6. The apparatus as recited in claim 1, wherein said sensor is for detecting vibration.
- 1 7. The apparatus as recited in claim 1, wherein said sensing unit is for attaching to an
2 architectural structure or to a vehicle.
- 1 8. The apparatus as recited in claim 1, wherein said data sensing unit is for wearing by
2 the live subject.
- 1 9. The apparatus as recited in claim 1, wherein said data sensing unit is for implanting in
2 the live subject.
- 1 10. The apparatus as recited in claim 9, further comprising a hermetically sealed housing,
2 wherein said sensor unit is located in said sealed housing.
- 1 11. The apparatus as recited in claim 10 wherein said housing comprises titanium or
2 ceramic.
- 1 12. The apparatus as recited in claim 10, wherein an antenna extends outside said housing
2 and is connected to a receiver or transmitter within said housing through a penetration
3 in said housing.
- 1 13. The apparatus as recited in claim 1, further comprising a microprocessor.

- 1 14. The apparatus as recited in claim 13, wherein said microprocessor is in said sensor
2 unit and wherein said first storage device is connected to said receiver and to said
3 sensor through said microprocessor.
- 1 15. The apparatus as recited in claim 13, wherein said microprocessor comprises said
2 triggering device.
- 1 16. The apparatus as recited in claim 1, wherein said sensor unit further comprises a
2 power supply.
- 1 17. The apparatus as recited in claim 16, wherein said power supply comprises a
2 rechargeable battery or fuel cell.
- 1 18. The apparatus as recited in claim 17, further comprising a circuit for recharging said
2 battery by inductive coupling.
- 1 19. The apparatus as recited in claim 18, further comprising a hermetically sealed
2 housing, wherein said sensor and said circuit for recharging is in said housing and
3 said coupling is through said housing.
- 1 20. The apparatus as recited in claim 18, wherein said circuit for recharging is in the
2 housing and the coupling is outside the housing.
- 1 21. The apparatus as recited in claim 1, wherein said sensing unit further comprises an RF
2 receiver for receiving a signal from said triggering device.
- 1 22. The apparatus as recited in claim 1, wherein said transmitting device is an RF
2 transmitter.

1 33. The apparatus as recited in claim 30, wherein said feedback device is an active
2 damping element to reduce vibration in response to measured excessive vibration.

1 34. The apparatus as recited in claim 1, wherein said second data storage device
2 comprises a computer.

1 35. The apparatus as recited in claim 1, wherein said control unit further comprises a
2 device to signal a user that data exceeding a preset threshold has been reached.

1 36. The apparatus as recited in claim 1, wherein said control unit further comprises a
2 transmitter.

1 37. The apparatus as recited in claim 36, wherein said control unit comprises said device
2 to trigger said sensing unit through said transmitter.

1 38. The apparatus as recited in claim 1, wherein said control unit is capable of sending
2 address information to said sensor unit to communicate with an individual sensor unit
3 of a plurality of sensor units.

- 1 39. A method of collecting data, comprising the steps of:
2
- 3 a) providing a sensing unit for attaching to a structure or live subject for sensing a
4 parameter of the structure or live subject, said sensing unit comprising a sensor,
5 a first data storage device, and a transmitting device, said first data storage
6 device for storing data from said sensor;
- 7 b) providing a control unit separable from said sensing unit, said control unit
8 comprising a data receiving device and a second data storage device different
9 from said first storage device, said data receiving device to receive data
10 transmitted from said data sensing unit, said second data storage device for
11 storing said data received from said sensing unit; and
- 12 c) providing a trigger signal for modifying the storing of data being stored to said
13 first data storage device or for initiating transmission of data from said sensing
14 unit to said control unit, wherein said trigger signal is a real time change in
15 information about the structure or live subject.